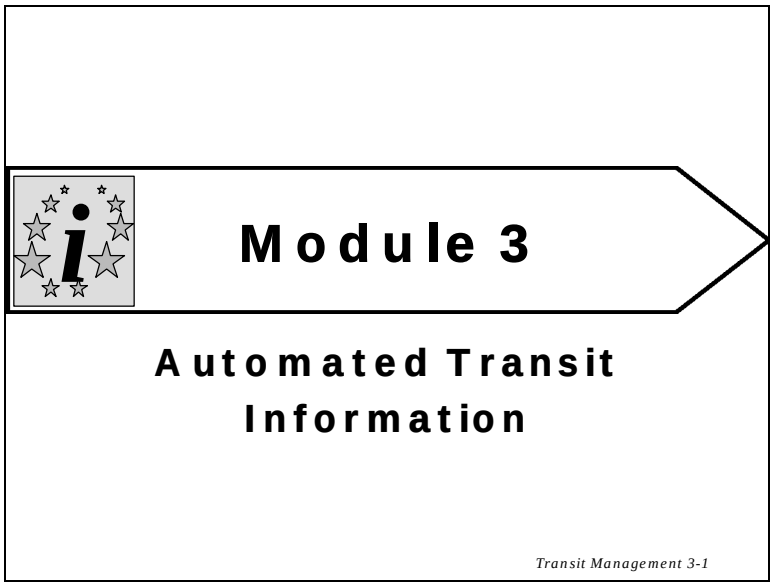
Module 3: Automated Transit Information



TRANSIT MANAGEMENT TRAINING ROADMAP	
	Module 1: Introduction to ITS and APTS
	Module 2: Automatic Vehicle Location Systems
	Module 3: Automated Transit Information
	Module 4: Transit Telecommunications
	Module 5: Transit Operations Software
	Module 6: Paratransit Computer-Aided Dispatch
	Module 7: Electronic Fare Payment
	Module 8: Technologies for Small Urban and Rural Transit Systems
	Module 9: Stages of ITS Project Deployment
	Module 10: What Can ITS Do for Me?

Where Automated Transit Information is happening:

- Pre-trip
- In-Terminal/Wayside
- In-Vehicle

Access Media:

- **Telephone** (most common)
- Pagers/personal communication devices
- Monitors
- Cable TV
- Variable message signs
- Kiosks
- Personal computers
- Internet
- Hand held devices

Multimodal traveler information systems

Module 3: Automated Transit Information
1.5 Hours

Introduction

Schedule

The following table shows the times and activities for this module.

Time	Activity/Topic
3 min.	*Lecture/Discussion:* Introduction
12 min.	*Lecture/Discussion:* What Is Automated Transit Information?
15 min.	*Lecture/Discussion:* Pre-Trip Systems
10 min.	*Lecture/Discussion:* In-Terminal/Wayside Systems
10 min.	*Lecture/Discussion:* In-Vehicle Systems
10 min.	*Lecture/Discussion:* Multimodal Traveler Information Systems
30 min.	Exercise 2-1: Custom Course Notes
90 min.	Total Time

To prepare

Have available:

- speaker phone or taped recording of ATIS system
  - ◊ Boston's Smart Traveler
  - ◊ Test what you will demonstrate ahead of time (see pre-trip phone systems)
- laptop with Internet access
- phone line

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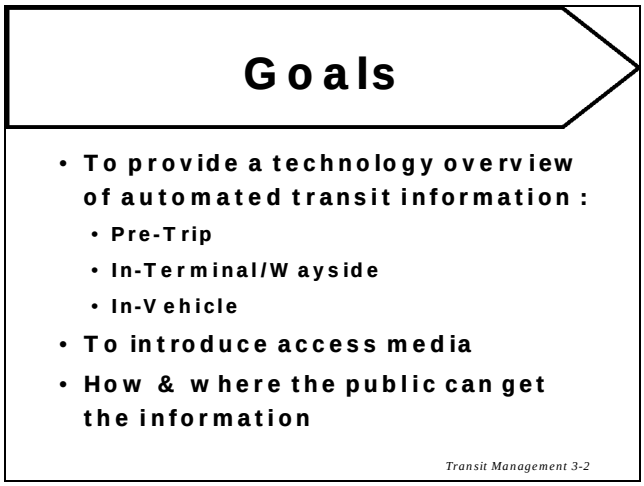
Introduction, Continued

Slide: Goals



Goals

READ the goals of this module.

Objective

Read the module objective:

- Given an APTS Technology Reference table, students will list three benefits of using Automated Transit Information Systems.

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Introduction, Continued

Slide: Course Roadmap

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Orient with the roadmap

Show slide.

Show the class where they are with the roadmap on page 1 of their SG.

Explain that this module will be the first of the technology modules and how it relates to the three parts of the ITS Infrastructure we discussed in Module 1:

- traveler information
- transit fleet management
- electronic fare payment

SG reference

Say: Your Student Guide is for reference back in your office. All of the information in this module's lecture is in there to refresh your memories later.

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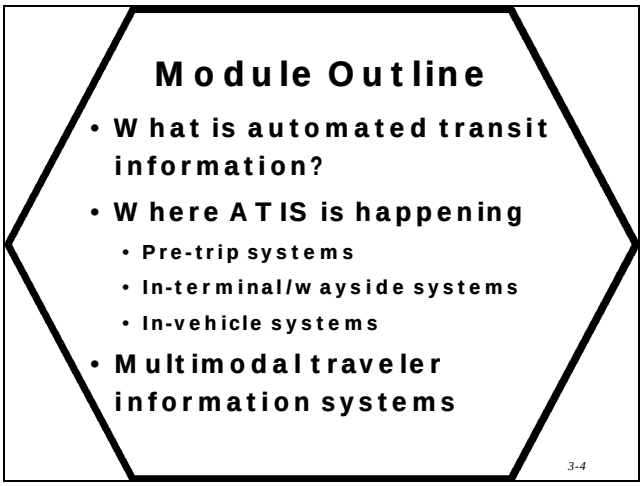
Introduction, Continued

Slide: Module Outline



Module outline

Explain the module outline.

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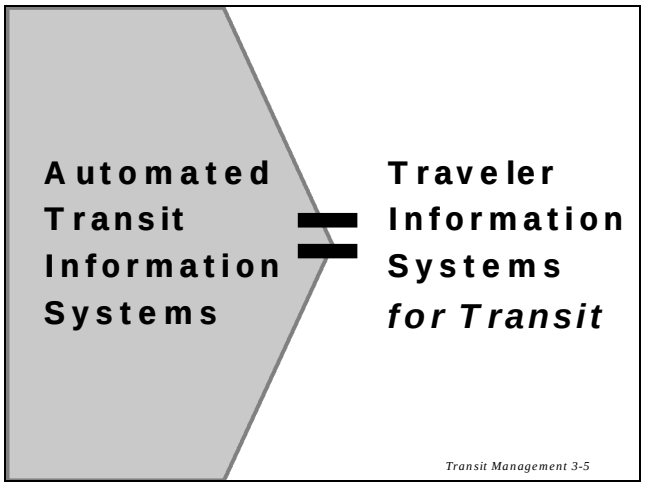
Introduction, Continued

Slide: Automated Transit Information Systems



ATIS

Show the slide.

Continued on next page

Introduction, Continued

Note to instructor

Note to instructor: This module contains a number of references to automated transit information systems that may be of interest to the class. Wherever possible, use local references, such as phone numbers or Internet sites.

The following table may be of help:

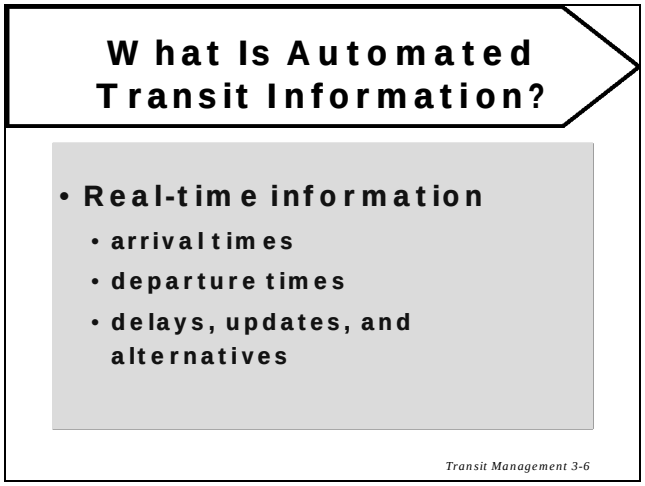
City	Access
Region 1: Boston	• SmarTraveler: 357-1234 • *www.mbta.com*
Region 2: NYC	• *www.mta.nyc.ny.us* • *www.ci.nyc.ny.us*
Region 3: Philadelphia	• *www.septa.com*
Region 4: Atlanta (Miami)	• *www.atlanta-traveler.com*
Region 5: Chicago (Minneapolis)	• *www.transitchicago.com* • *www.metrotransit.org*
Region 6: Arlington, TX (Houston/San Antonio)	• Houston Smart Commuter FOT (Houston Metro) • *www.hou-metro.harris.tx.us*
Region 7: Kansas City (St. Louis)	• *www.bi-state.org*
Region 8: Denver (Salt Lake City)	• *www.rta-denver.com* • *www.utabus.com*
Region 9: San Francisco (Southern CA - San Diego/Los Angeles)	• Sacramento commuter information: 1-800-COMMUTE • *www.transitinfo.org* • TravInfo 817-1717
Region 10: Seattle (Portland)	• *www.wsdot.wa.gov/CPSRTA* • *www.pnl.gov*

What Is Automated Transit Information?

Length

12 minutes lecture/discussion.

Slide: What Is Automated Transit Information?



What are Automated Transit Information Systems?

Explain that Automated Transit Information Systems are systems that are designed to deliver transit information to the transit rider.

Generally, the types of information that are provided include both real-time information and static information.

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What Is Automated Transit Information?, Continued

Real-time

Ask: What do we mean when we say "real-time" as opposed to "static information"?

Answer: Real-time information:

- describes situations as they unfold or as they are actually happening, and can change over time
  - ◊ actual transit arrival times at stops
  - ◊ delays, updates, and alternatives in service

Say: "Real-time" has different meanings in different modes.

- Traffic/Highway applications allow greater elasticity than transit systems.
- Each agency must set its own policy on what "real-time" information it needs.
  - ◊ e.g., Is a 5-minute delay "real-time"? For some traffic applications, this might be acceptable. However, for many transit applications, this is probably too much of a delay.

Answer: Static information:

- describes situations that do not change or do not change often
  - ◊ transit routes and maps
  - ◊ fare information
  - ◊ trip planning, e.g., itinerary, schedules
  - ◊ scheduling

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What Is Automated Transit Information?, Continued

Slide: Where ATIS Is Happening

Where ATIS is happening

Say: Passengers can access automatic transit information:

- pre-trip - available before a passenger begins a trip; for example, a passenger accesses transit information on a PC.
- in-terminal/wayside - available while a passenger is en route, such as in a transit terminal or a transfer area
- in-vehicle - available on-board a transit vehicle

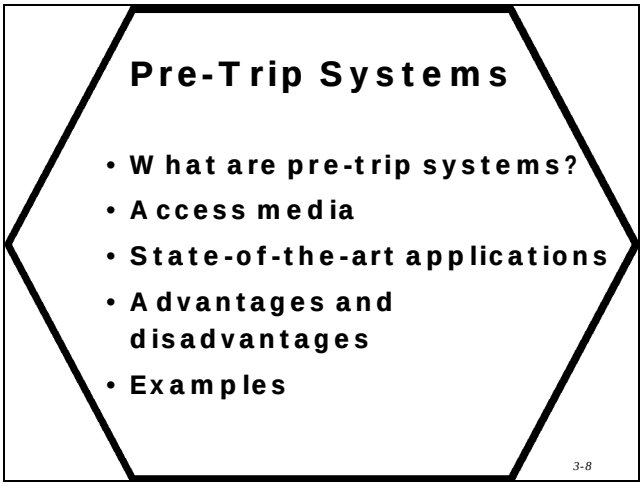
Something you may notice in this module is a trend in which transit agencies are reaching new audiences with information – almost like a marketing opportunity to increase ridership. You'll hear more about that as we get into the module.

Pre-Trip Systems

Length

15 minutes lecture/discussion.

Slide: Pre-Trip Systems



Pre-Trip systems

Explain outline of Lecture/Discussion.

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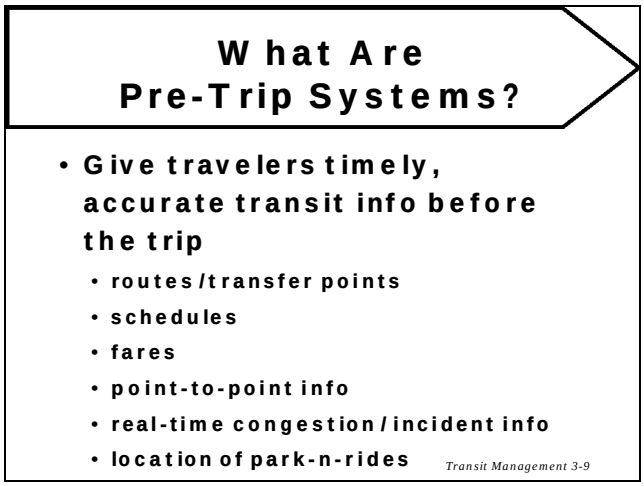
Pre-Trip Systems, Continued

Slide: What Are Pre-Trip Systems?



Information provided by pre-trip systems

Say: Pre-trip automated information describes:

- routes/transfer points
- schedules
- fares
- point-to-point information (the best route from one place to another)
- congestion and incident information
  - ◊ Real-time congestion information can attract SOV riders.
  - ◊ It could be helpful in planning routes around construction; for example, Boston's $8 billion Central Artery reconstruction project interrupts traffic and therefore encourages use of local and express buses and trains.
- location of park-n-rides

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Pre-Trip Systems, Continued

Why passengers should use pre-trip

Say: Because pre-trip automated transit information gives travelers precise, accurate information ahead of time, customer satisfaction increases. Pre-trip transit systems help to make transit a viable, easy alternative to single occupant vehicles.

Note to instructor

Note to instructor: At the end of this lesson, we will demonstrate some of these technologies through the use of downloaded web pages or screen printouts.

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Pre-Trip Systems, Continued

In the past

Say: Transit information traditionally has been provided to the transit rider by either the operator or other transit personnel, without the help of automation.

To see the benefits of automated transit information systems, it is necessary to think about some of the non-automated transit information systems that are being replaced, for example:

- In the past, transit passengers called operators who would look up information from books and paper schedules. It could take a long time to find the information for the passenger.
  - ◊ Now, automation can speed up finding information.

- In the past, schedules, maps, and fare information were printed on paper. Paper and printing costs have increased, making this option more expensive. Passengers are also sometimes unable to easily obtain a paper schedule if the information area is out of schedules.
  - ◊ Now, information is available in electronic form, or via automated phone systems, or in other ways, which we will discuss in this module.

TELL students that they will learn how Automated Transit Information systems solve these problems as the module continues.

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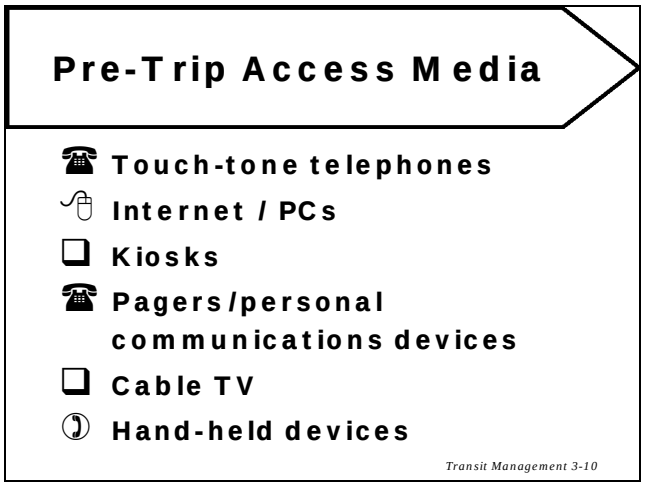
Pre-Trip Systems, Continued

Slide: Pre-Trip Access Media



Class questions

Ask questions to see how familiar the class is with the technologies listed on the slide, e.g.:

- Has anyone ever used a touch-tone pre-trip information system?
  - ◊ What kind of information did you get?
  - ◊ How did it work?

Ask several more questions for each of the more popular access media on the slide and then **explain** each one.

Note to instructor

OPTIONAL: Note to instructor: Have a tape player available. You will demonstrate a playback of recorded ATIS messages in class or provide "live" access to examples via phone, if available in the classroom.

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Pre-Trip Systems, Continued

Major pre-trip systems

Say: The three most common pre-trip systems are:
- touch-tone telephones
- kiosks
- Internet

We'll discuss these briefly here, and in more detail in a few minutes.

Touch-tone telephones

Say: Passengers can access pre-trip automated transit information through touch-tone phones:
- automated call answering with voice synthesizers
- a human operator with automated data retrieval systems
- pre-recorded messages

Phones are the largest and most common method of accessing pre-trip systems.
- most proven of the access media listed

Kiosks

Say: Kiosks can be located in high pedestrian traffic areas like shopping centers, malls, transportation stations, or transit centers. The kiosks provide:
- a touch screen interface
- audio and visual information
- opportunities for promotion (if a passenger uses a kiosk to plan a trip, he/she gets one free ride ticket or a coupon for shopping discounts)

Although kiosks are a popular idea, there are some disadvantages that make them less likely to be successful, which we'll talk about in a few minutes.

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Pre-Trip Systems, Continued

Internet

Say: Many transit agencies of all sizes are using the Internet as an inexpensive tool to disseminate information. We have over 60 sites listed at the back of your student guide for your reference.

- A comment on this trend: The Internet is just one tool that transit agencies are using to reach new audiences with information – like the marketing opportunity to increase ridership that we mentioned earlier. The idea here is that you can reach a broader ridership by getting pre-trip transit information in front of the public. The Internet is just one of the tools being used to reach a number of different market segments.

Other access media

Say: Now we'll look at the other media on the slide. These aren't as common as the first three, but they are being used today.

Pagers/ PCDs

Say: Pagers and personal communications devices (PCD) like hand-held devices can be used to receive transit information.

Cable TV

Say: Passengers can also use cable TV to look up transit information. Cable TV comes in two forms:

- interactive televisions (for example, these could be located in hotel rooms)
- dedicated cable TV channel (like the Weather Channel)

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Pre-Trip Systems, Continued

PCs

Say: Potential passengers can use PCs at home or at work to go on the Internet through the World Wide Web (WWW) and reach transportation websites to find out pre-trip transit information.

Hand-held devices

Say: Hand-held devices are new applications for transit, and include pagers and other personal communications devices.

- e.g., personal notepads (like the Apple Newton), watches, etc.

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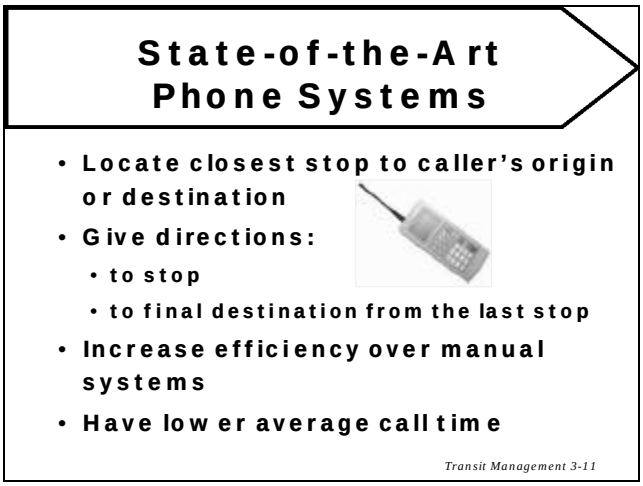
Pre-Trip Systems, Continued

Slide: State-of-the-Art Phone Systems



Phone systems

Say: Passengers using state-of-the-art touch-tone phone systems can:

- locate the closest stop to their current location
  - ◊ For example, an operator using geographic information systems (GIS) accesses information about the caller's current location and the nearest stop.
  - ◊ Also, callers punch in choices from an automated menu on their touch-tone phones to identify locations and stops.
- obtain directions to the nearest stop
- locate the closest stop to their destination
- obtain directions from a stop to their destination

Say: The best systems for customer satisfaction are hybrid automated with optional human interaction.

- e.g., where a customer can call and get automated information, but isn't trapped in an endless loop – instead they can get to an operator easily.

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Pre-Trip Systems, Continued

Demo

Demonstrate a touch-tone phone system.

- If possible, use a local system.
- If not, use the pre-recorded tape of Boston's "Smart Traveler."

Demo instructions for Boston's Smart Traveler

Say: The "Smart Traveler" system is a public-private partnership, started with a public subsidy from local jurisdictions, which is eliminated after a period of time.

- **Demo** the tape.
  - ◊ Allow the class to hear no more than two to three minutes of the tape.

Class question

Ask:

- What agencies do you know of that have pre-trip phone systems?
  - ◊ What has been the customer feedback?
- How many of you are aware of agencies that currently have a totally manual, non-automated phone information system?

Ask for one or two personal stories.

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Pre-Trip Systems, Continued

Slide: Phone Systems Examples

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Minnesota Guidestar DARTS

Say: The 25-vehicle system, Guidestar, in Dakota County, a high-growth suburban and rural county south of St. Paul, Minnesota, provides dial-a-ride services to seniors and people with disabilities, and general public community circulator service in limited areas. DARTS (Dakota Area Resources and Transportation for Seniors) has been the test site for an FHWA field operational test designed to measure the benefits of advanced technologies on the paratransit environment.

DARTS uses:

- computer assisted scheduling dispatch
  - ◊ uses Trapeze Quo Vadis software
- mobile data terminals (MDTs)
- automatic vehicle location (AVL) devices

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Pre-Trip Systems, Continued

Detroit SMART

Say: The Suburban Mobility Authority for Regional Transportation (SMART) in Detroit has implemented automated scheduling and dispatching software for paratransit. It is currently being integrated with their automatic vehicle location (AVL) system. This software is being upgraded to a Windows NT platform, which will assist in providing remote scheduling capability to other service providers in the greater Detroit area.

In late 1997, SMART began installing remote scheduling and dispatching capability at five service providers. One year later, SMART had 25 service providers with that capability.

SMART provides dial-a-ride service with no advance notice deadlines:

- Customers call and request a ride immediately and SMART's dispatchers do their best.
- Some of the community transit buses run on a service-route – a bus covers an entire service area with two endpoints on a schedule – while other transit providers cover an entire township or county without a schedule.

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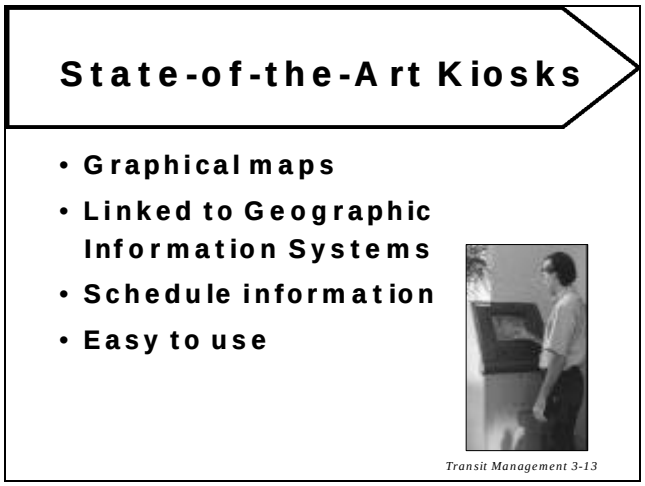
Pre-Trip Systems, Continued

Slide: State-of-the-Art Kiosks



Kiosks

Explain kiosks:

Passengers can obtain the following pre-trip information from kiosks at stops or transportation centers:

- graphical images of transit routes and stops
- links to geographic information systems (GIS) and multiple transit databases which can provide maps of the area
- schedules
- fares

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Pre-Trip Systems, Continued

Other features

Explain other kiosk features:

- The information can be displayed in any language or visual form the user chooses, such as large type.
- Some kiosks actually have the capability to print directions
  - ◊ usually private sector kiosks, e.g., car rental agencies
- A kiosk can collect fares, dispense cards, etc.
- Kiosks may be located in:
  - ◊ Transit centers
  - ◊ Shopping centers/malls
  - ◊ Employment centers
  - ◊ Welfare to work areas

Class question

Ask the students:

- What agencies do you know of that have trip kiosks for pre-trip planning?

Ask for one or two personal stories.

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Pre-Trip Systems, Continued

Slide: State-of-the-Art Internet

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Pre-Trip Systems, Continued

State-of-the-art Internet

Explain: The Internet is a useful tool:

- inexpensive
  - ◊ The relative cost of setting up a homepage on the Internet is low (as little as $100 start-up costs for a basic, no-frills site) when you "rent" space from a service provider.
  - ◊ Annual or monthly maintenance fees may be charged by service providers.
  - ◊ Costs would be higher if you chose to run your own web site.

- easy to develop
  - ◊ The ease of development has driven down the cost.
  - ◊ There are easy, no-frills, menu-driven software packages that can be used by "non-developers" to create a simple web site.
  - ◊ There are many companies out there who want to create web pages for you.
  - ◊ There are also agencies that have partnered with others to share a site; e.g., universities or educational institutions in the community, and/or partnering with others in the community.

- reaches broad public audience
  - ◊ Although some areas and/or populations are harder to reach, such as rural areas, low-income, elderly, and disabled populations

- various levels of commitment
  - ◊ You can make it as complicated or as simple as you like, and upgrade as you go along.

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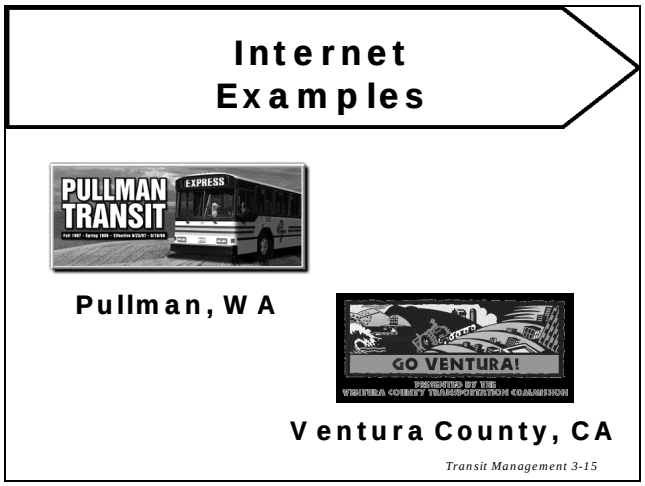
Pre-Trip Systems, Continued

Slide: Internet Examples



Pullman

Explain example:

- Pullman, Washington
  - ◊ *www.pullmantransit.com*

- A small agency (town population of 24,650 according to their web site) with transit information
  - ◊ routes
  - ◊ online schedules
  - ◊ express bus line information
  - ◊ rider alerts (not real-time, but monthly or as needed updates on schedules or holidays)

- Internet is available to even small agencies with small budgets.
  - ◊ We'll talk more about what is available to agencies in small urban or rural areas in Module 8.

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Pre-Trip Systems, Continued

Ventura

Explain example:

- Ventura County, CA
  - ◊ *www.GOVENTURA.ORG*

- extensive intermodal/inter-agency web site
  - ◊ information about Ventura county Transportation Commission – the board that "keeps Ventura County moving"
  - ◊ projects with highway, bus services, bike paths, aviation, commuter and freight rail roads and more

- mobility information
  - ◊ getting there by bus or train, including transit routing, local bus service, monthly pass information, guaranteed ride home program, and other modes (from Amtrak to Greyhound to the airport)
  - ◊ senior and disabled transportation
  - ◊ traffic reports
  - ◊ ride sharing and park-n- rides
  - ◊ bike path maps

Class question

Ask the students:

- What agencies do you know of that have the Internet for pre-trip planning?

Ask for one or two personal stories.

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Pre-Trip Systems, Continued

Slide: State-of-the-Art Technology Integration

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Pre-Trip Systems, Continued

State-of-the-art technology integration

Say: Transit information systems are beginning to look at incorporating multiple technologies and information exchange to improve the entire transit service provided to passengers.

Automatic vehicle location systems (AVL) are one of the technology applications which is being tied in to other areas, such as transit information systems.

- Imagine if you not only know exactly where your transit vehicle is, but you can transfer that information to a passenger trying to get on it.
- The transit agency needs to link planning data and other pertinent information, e.g.:
  - ◊ transfer points
  - ◊ connection points
  - ◊ usage information for planning
  - ◊ Ann Arbor is looking at “time transfers”
- This kind of exchange is made possible through telecommunications – the glue that holds ITS applications together. We’ll be talking about that in Module 4.

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Pre-Trip Systems, Continued

AVL and ATIS

Explain the following example:

- Automatic vehicle locators can be tied to Automated Transit Information systems, so passengers can obtain real-time information.
  - ◊ For example, not only can a visitor at the airport find out where bus stops are in order to get around the city, but the visitor can know when the next bus arrives using a pre-trip automated transit information system.

Remind students that AVL and ATIS, as well as the other applications of technology for transit systems, are only made possible through telecommunications, which we'll be talking about in Module 4.

Advantages and dis-advantages discussion

Ask the following questions and write the answers on the board:

- How do you think pre-trip systems could benefit the passenger?
- How can they benefit the agency?
- What would it do to your operating costs if you had to switch from a manual information system to an automated one?
- What would it do to your staffing and training needs?
- List some of the risks.

Review the answers.

- **Say**: Let's compare your answers with our slides.

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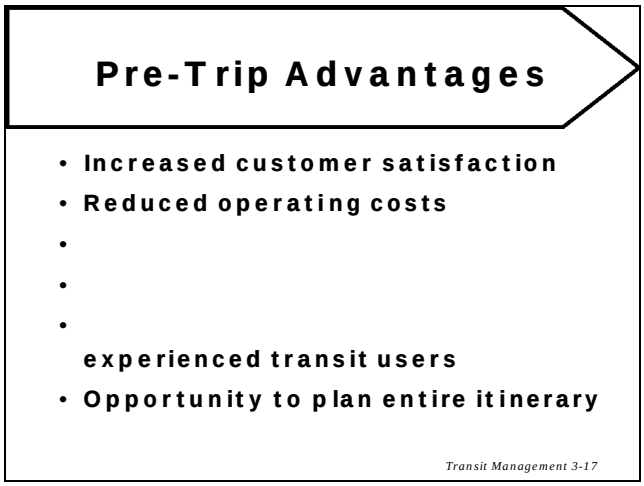
Pre-Trip Systems, Continued

Slide: Pre-Trip Advantages



Advantages of pre-trip systems

Review any item on the slide that was not covered already.

The advantages of pre-trip automated transit information systems include:

- Accurate, and sometimes real-time, information is available to passengers before they embark on a trip.
- Reduced operating costs for pre-trip telephone systems resulting from lower average call time for users, and lower labor intensity for operators and operating systems
- Because the new pre-trip systems are easy to use, passengers can access transit information and make it their choice of travel, thereby increasing customer satisfaction.
- For pre-trip telephone systems, a quicker response time leads to greater volume capacity for the phone systems.
- The new systems work for both novice and experienced users.
- Passengers have the opportunity to plan an entire trip with any or all of the pre-trip technologies.

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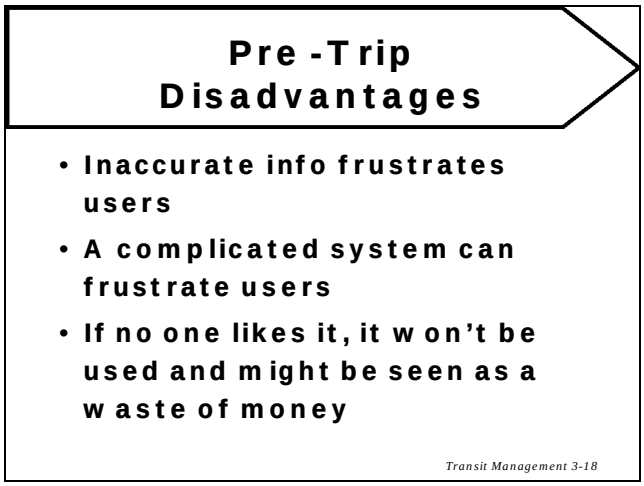
Pre-Trip Systems, Continued

Slide: Pre-Trip Dis-advantages



Dis-advantages of pre-trip systems discussion

Review any item on the slide that was not covered already.

The disadvantages of pre-trip automated transit information systems include:

- If the information is not updated in real-time, it may anger customers.
  - ◊ Customers may unnecessarily take alternate routes or make travel arrangements based on out-of-date accident information.
  - ◊ The most frequent complaint from travelers regarding transportation information is that information is not current or reliable.
- The up-front costs of the equipment
- If the users don't like the system, they won't use it and may perceive it as a waste of money.
  - ◊ Note: This is unlikely, based on field deployments to date.
- These risks may mean loss of customer satisfaction.

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Pre-Trip Systems, Continued

Examples

As of the end of 1995, according to the U.S. DOT report on APTS, the following benefits of automated transit information systems were reported:

- San Diego County's interactive voice response system has allowed information agents to increase their productivity in handling calls by over 21%.

- Rochester-Genesee Regional Transportation Authority has implemented an automated transit information system that answers 70% of information request calls. Calls have increased by 80%.
  - ◊ This system will allow the Authority to operate more cost effectively.

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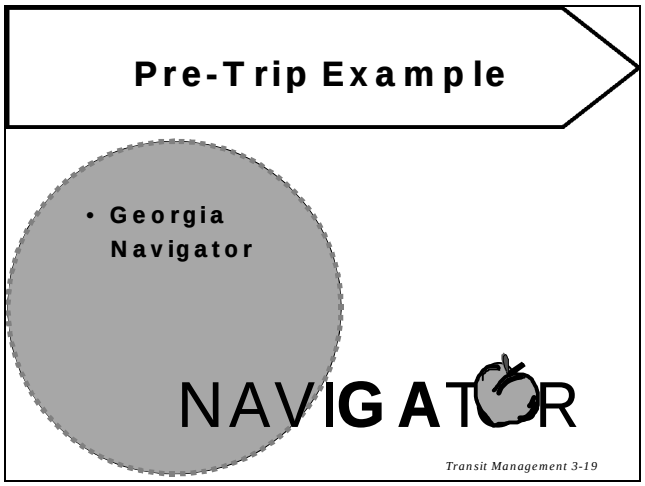
Pre-Trip Systems, Continued

Slide: Pre-Trip Example



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Pre-Trip Systems, Continued

Pre-trip example

Explain the example (information is from *www.georgia-traveler.com*).

Georgia's intelligent transportation system is designed to gather information from a variety of sources: a video monitoring and detection system, Highway Emergency Response Operators (HEROs), and the public. NAVIGATOR processes the information using Geographic Information Systems software, then formulates an appropriate response plan. The response plan is reviewed before being implemented by NAVIGATOR and communicated to the public. This allows the public to make informed choices about their transportation options.

What sets Georgia's system apart from other transportation management networks around the country is the high level of inter-agency integration it has achieved. NAVIGATOR links the Transportation Management Center (TMC) to the Transportation Control Centers (TCCs) of five surrounding counties (Cobb, Gwinnett, Clayton, Fulton and Dekalb), the City of Atlanta, and the Metropolitan Atlanta Rapid Transit Authority (MARTA), creating an intelligent transportation network spanning more than 220 freeway miles. These satellite facilities manage surface-street-monitoring cameras and traffic signals within their jurisdictions. This broad system allows local, regional, state and federal officials to communicate more effectively, and in turn, manage Georgia's transportation system more efficiently.

Besides being available on the Internet, the information is available via a free cellular phone service, and traveler information kiosks located in transportation hubs that have up-to-the-minute info on traffic congestion, MARTA schedules and other traveler information.